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CENTER FOR REPRODUCTION OF ENDANGERED SPECIES

REPORT
SPRING 1998

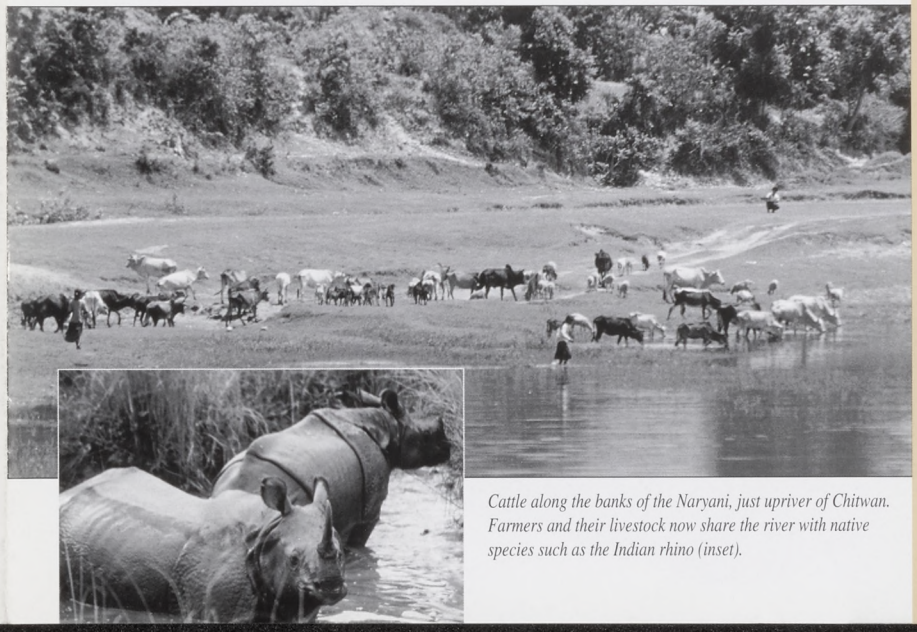
Under Threat of Pollution: Nepal's Royal Chitwan National Park

The Naryani, one of the major rivers of Nepal, rises in the Himalayas, flows south through Royal Chitwan Park and then into India, where it eventually enters the Ganges. Listed as a World Heritage Site, Chitwan Park receives an average of 65,000 visitors a year. The remarkable and unique mixture of wildlife in Chitwan Park—which includes the one-horned Indian rhinoceros, Asian elephant, tiger, leopard, sloth bear, wild dog, hyena, gaur, langur, gharial, mugger crocodile, and many species of birds—is largely dependent on the Naryani as a source of food and water. But the river is no longer pristine: a brown stain in the water can be seen for many miles.

In the past ten years, the human population along the banks of the Naryani and just upstream from Chitwan has increased dramatically. The inevitable deforestation has followed, along with an increase in agriculture and industry—and, of course, a huge increase in pollution. This situation prompted the Nepalese to initiate a research project to assess the level of pollution in the Naryani River. It has brought together CRES endocrinology division staff and a team of students from Tribhuvan University in Kathmandu, Nepal, and from Florida International University.

Of particular concern is the effluent from a recently constructed paper mill—and the road through the once-pristine

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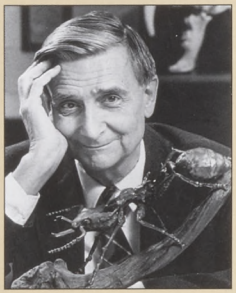


Cattle along the banks of the Naryani, just upriver of Chitwan. Farmers and their livestock now share the river with native species such as the Indian rhino (inset).

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The Tyler Trust Donation
Supporting giant panda conservation at CRES.
See page 3.



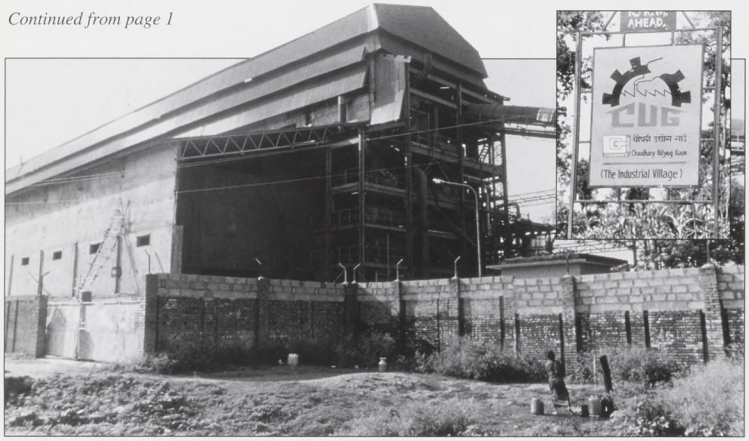
Dr. Edward Wilson
An evening with the Conservation Medalist.
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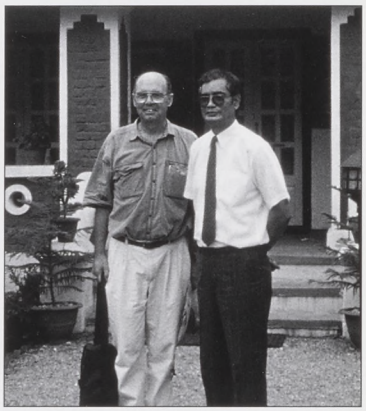
Cans for Critters in 1998!
Join the spring drive and help CRES.
See page 5.

Under Threat of Pollution: Nepal's Royal Chitwan National Park

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This paper mill factory and the road leading to it were a gift of the Chinese government to the Nepalese. The advertisement for an industrial village (inset) indicates more factories are being built near the Naryani, which will lead to increased pollution that affects local wildlife.



Author and CRES endocrinologist Dr. Valentine Lance (left) at the Central Zoo, meeting with R.K. Shrestha, director of the King Mahendra Trust for Nature Conservation in Nepal.

forest—that was built along the banks of the Naryani. When first built, the factory had the production capacity of 13 metric tons per day. Today, the mill has the capacity of 70 metric tons per day and employs 500 full-time workers.

An enormous amount of water—250 cubic meters per minute, or approximately 66,000 gallons per minute—is drawn from the river. Five percent is consumed and the rest is poured back into the river in the form of a dark brown, foul-smelling effluent. This effluent is produced 24 hours per day, 7 days a week.

The impact of this one mill alone is not known, but it is probably significant. The director of Chitwan Park is concerned about this potential threat to the health of the park's ecosystem, as are a number of other Nepalese conservationists. However, in order to persuade the government to exert some measure of control over this pollution, we must first document the extent of pollution in the river.

There have been a large number of studies on the effects of pulp mill effluents on aquatic wildlife in Canada, the United States, and northern Europe, and all showed negative impact. Even in the most modern mills, where attempts have been made to reduce the levels of toxins in the effluent, there are still significant effects on wildlife. In addition to this mill, there are a number of small factories under construction in the area and a major brewery and distillery—all of which will be adding their effluent to the Naryani River.

The impact of road building on forested areas is now well known. The road along the Naryani's banks is a classic example of how such well-intentioned efforts can lead to ecological disaster. The spectacular forests that supported one of the richest faunas in the world are almost gone. The population along this stretch of river is increasing rapidly. With a modern road, a large pool of cheap labor, and an unlimited supply of water from the Naryani, this region will attract even more industry.

We are documenting levels of pollutants in the river at various points, starting upstream from the mill and at intervals downstream, where the river enters Chitwan Park. A report on the levels of pollution and their potential threat to the wildlife of Chitwan will be presented to the Nepalese government, with a goal for conservation and antipollution measures to be implemented before irreparable damage is done.

—Valentine Lance, Ph.D.
Head of Endocrinology Division/CRES



Unique and endangered species like this one-horned Indian rhinoceros are dependent on the Naryani River. This CRES project will document levels of pollution in the water, which is a potential threat to the health of the park's ecosystem.



Ecology

For the past two years, the CRES ecology division has been working to incorporate a public education component into our existing iguana research program at Guantanamo Bay, Cuba, through the National Science Foundation Informal Science Education Program. Although Cuban iguanas comprise a conspicuous part of the local wildlife and have been adopted as an informal mascot by many, their biology and conservation status are not widely understood or appreciated. Developing an education program centered on our research program represented an excellent opportunity for us not only to increase the public's appreciation for environmental issues related to endangered species but also their understanding of scientific approaches and research methodologies in general. As part of the program, we provided opportunities for interested people of all ages to participate in standardized iguana censusing and help us collect behavioral data. Throughout the program, we have continued to emphasize the value of scientific experimentation in addressing complex research questions, the concept of testing a scientific hypothesis through carefully designed and controlled studies, and the basics of data analysis and interpretation and how these lead to scientific conclusions and the development of further research questions. Feedback in the form of surveys has been overwhelmingly positive, with most participants experiencing a significant positive shift in attitude toward endangered species conservation and scientific research, following their experience in the field. While our educational program is targeted primarily at residents of Guantanamo Bay, it serves as a valuable model for development of similar programs on United States military bases worldwide.

In Recognition of the Tyler Trust

The Zoological Society is fortunate to have received significant funding for the Giant Panda Conservation Program from the Alice C. Tyler Perpetual Trust. The founder of Farmer's Insurance Group, the late John Tyler and his late wife, Alice, enjoyed outdoor life and resolved to help conserve what is natural and beautiful in our world. Together, the Tylers established a remarkable record of philanthropy, including the inception in 1974 of the prestigious John and Alice Tyler Prize, recognized as America's foremost environmental award.

A constant in Alice and John Tyler's lives was their affection for animals. Today the causes closest to Mrs. Tyler's heart—abused children and animals—are reflected in her legacy through the Alice C. Tyler Perpetual Trust. Since February of 1996, the Tyler Trust has given $120,000 in support of giant panda conservation at CRES. This funding has enabled the genetics and endocrinology divisions to gather a tremendous amount of data, increasing our understanding of this critically endangered species.



Grants

The Center for Reproduction of Endangered Species is grateful to the following for their support of imperiled wildlife:

The Alice C. Tyler Perpetual Trust made a $45,000 grant to assist in improving methods for giant panda population assessment and genetic monitoring; to train Chinese scientists in genetic and endocrinology techniques; and to continue studies in male and female panda reproduction. **The Heller Foundation of San Diego** awarded a $30,000 Bud Heller Conservation Fellowship to the California Condor Recovery Program for behavior research. The **Armstrong McDonald Foundation** gave a $30,000 grant to the CRES reproductive physiology division in support of Dr. Barbara Durrant's research in carnivore conservation, and the **Alphonse Burnand Medical and Educational Foundation** made possible the purchase of a computer for CRES studies of the giant panda. Grants to the CRES genetics division were awarded by the **McCarthy Family Foundation** for Dr. Oliver Ryder's arroyo toad conservation work, and by the **John and Beverly Stauffer Foundation** for rhinoceros conservation studies.

Edward Wilson, 1998 Conservation Medalist: A Gentle Warrior for the Natural World

When a biologist is passionate about an aspect of research, whether it is with giant pandas or bacteria, the fascination lasts a lifetime. For Edward Wilson, this year's Conservation Medalist, the choice was made while he was still a boy. After a fishing accident cost him the sight in his right eye, he was determined to "celebrate the little things of the world, the animals that can be picked up between thumb and forefinger and brought closer for inspection." What had fascinated young Ed Wilson as he roamed the woods of his native Alabama was the busy, social world of the ant.

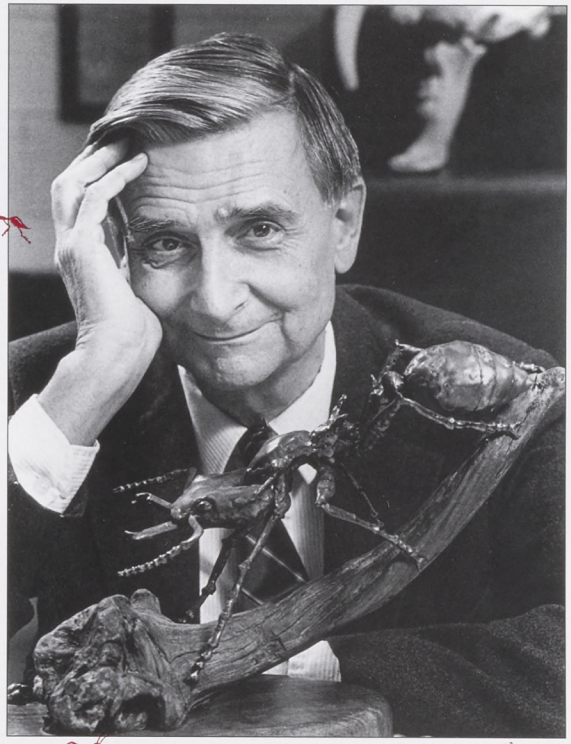
Since that time, ants have become the center of Dr. Wilson's work. In his early days at Harvard University as a doctoral student in the 1950s—where the entomology department housed the world's largest collection of ants—he focused on the dacetine species and declared it to be "under the microscope the most aesthetically pleasing of all insects." Over the years, this has led colleagues to affectionately call him "the ant man." Fittingly, one of his two Pulitzer Prizes was awarded to *The Ants*, which he published in 1990.

Edward Wilson's early work led him to investigate how ants communicate. He was one of the first to explore the chemistry of smell and how this is linked to behavior. Wilson found that the small Dufour's gland in fire ants contained a chemical communicator—which is called a pheromone today—and this research opened a new field of biochemistry and work with other species.

Wilson's fieldwork has taken him all over the world, in pursuit of studies on biodiversity and island biogeography. He also became interested in new ways to understand diversity in the social animals, looking for a unifying theory with a genetic basis. This led to the publication of *Sociobiology: The New Synthesis*, in 1975: "I covered all the organisms that could even remotely be called social, from colonial bacteria and amoebae to troops of monkeys and other primates." After this book, he became known as the "father of sociobiology."

Wilson has become as passionate about the environment and the loss of biodiversity in species as he has been about ants. As he says, "We need the genetic diversity of wild plants to make our crops grow better and to provide new foods for the future. We also need biodiversity to develop new medicines….The more species we lose, the less able we will be to sustain life."

The Zoological Society recognizes in Edward Wilson one of the greatest naturalists of our time. He is listed among the top 100 scientists, past and present, and is the recipient of numerous scientific awards. Wilson's quiet but determined advocacy for the environment is always optimistic. As an emeritus professor with the Harvard University Museum of Comparative Zoology, he now has more time to write and serve on several boards of directors, where he continues to raise questions about our environment and "the affinity which humans have for other living things."



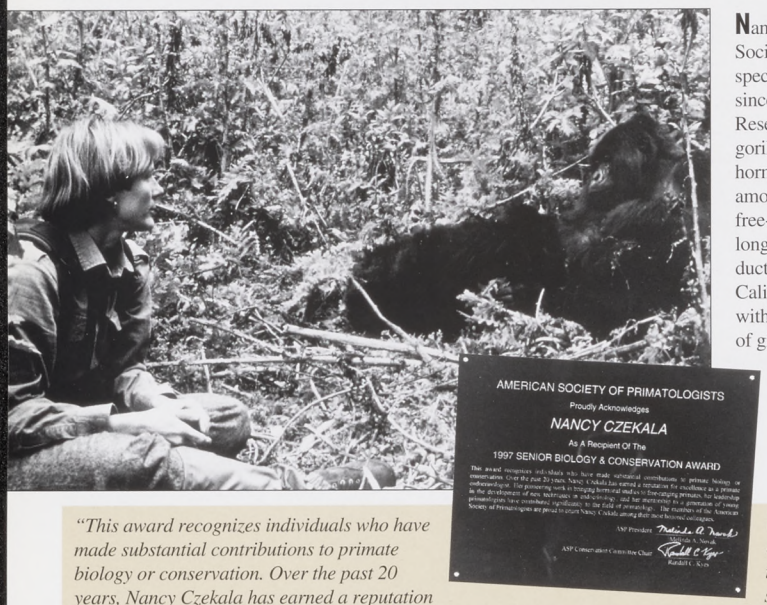
An Evening with the Conservation Medalist

The Zoological Society of San Diego is pleased
to honor its highly acclaimed
1998 Conservation Medal recipient,
Dr. E.O. Wilson.

Best known as the "Father of Sociobiology,"
Professor Wilson of the Harvard University
Museum of Comparative Zoology has fulfilled
a lifelong ambition to understand the social
behavior of the ant species of the world.

Dr. Wilson will present a program and
be honored at a dinner on
Friday, April 24, 1998,
at the Sheraton San Diego Hotel and Marina.
Dinner tickets are $60 per person.
For tickets, please call (619)557-3974.

An Award for Excellence: Nancy Czekala, Endocrinology Specialist



Nancy Czekala's 1997 award from the American Society of Primatologists is well deserved. As a specialist with the CRES endocrinology division since 1976, she has made several trips to the Karisoke Research Center, Rwanda, to study the mountain gorilla. These field projects, which evaluate urinary hormone profiles, are designed to study infertility among captive lowland gorillas by the comparison to free-ranging mountain gorillas. In addition to Nancy's long-term gorilla studies, she investigates the reproductive status of many species, such as the rhinoceros, California condor, and cheetah. She continues to work with scientists in China to increase the understanding of giant panda reproduction. Nancy is a member of several conservation and scientific organizations. Her pioneering work in hormonal studies and her mentorship to a generation of young scientists are recognized by this award.

"This award recognizes individuals who have made substantial contributions to primate biology or conservation. Over the past 20 years, Nancy Czekala has earned a reputation for excellence as a primate endocrinologist. Her pioneering work in bringing hormonal studies to free-ranging primates, her leadership in the development of new techniques in endocrinology, and her mentorship to a generation of young primatologists, have contributed significantly to the field of primatology. The members of the American Society of Primatologists are proud to count Nancy Czekala among their most honored colleagues."

Cans for Critters Celebrates in 1998!

We are excited to announce our partnership with Jammin' Z90, Radio Latina, and X99, to help promote the 1998 Cans for Critters program. With Reynolds Recycling's help, our team will be at different locations during the drive, through May 1, with live music, prizes, and the San Diego Zoo mascots. Just bring your family, friends, and aluminum cans and have fun! If you tune in to Z90 at 90.3 FM, the locations will be announced daily.

Cans for Critters is a fun and educational recycling program that enables all youngsters to actively contribute to the betterment of our environment and the future of endangered animals. Students can receive prizes, critter visits from the Zoological Society's education department, and participate in the Cans for Critters Jamboree awards celebration hosted at the San Diego Zoo on May 15. Proceeds from the program directly benefit CRES in its research projects aimed at improving the chances of survival for many threatened animals.

Last year, students from 31 schools participated in the 1997 17th Cans for Critters recycling program. Monitors from each school collected, crushed, and redeemed more than 500,000 aluminum cans for a total of $15,132.68. It takes only 1 can to save enough energy to power a TV for 108 minutes! Many thanks to all who participated in last year's program.

To join the program and receive all the benefits of the drive, or just to receive more information, please call Kathleen Rafaat in the development department at (619)557-3995. Don't forget to visit our new Web site at http://www.sandiegozoo.org/Society/critters.html.



Fifth grade Cans monitors at Carmel Del Mar Elementary hard at work! From left: Barbara Hessell, Elizabeth Hoffman, Chelsea Stone, Maya Carrillo-Fulk, Bethany Pepper, and Trevor Hall.

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- You become eligible to receive a tax deduction for the full fair market value of your stock on the date you gift it, no matter what you originally paid.
- Because you may deduct the full fair market value of your stock, the cost to you of making the gift is a fraction of its value to CRES.
- Unlike stock that is sold by you, when you gift it to CRES or to the Zoological Society of San Diego, you avoid capital gains taxes on the appreciation.
- You make a significant supportive contribution to CRES.
- You may choose to contribute your stock to a Charitable Remainder Trust (CRT) or to the Zoological Society's Pooled Income Fund and receive lifetime income from your gift.
- And, your gift may qualify you for prestigious Circle membership in the Society.



If you are interested in learning more about making a gift of stock, please feel free to contact Patrick O'Reiley, Estate Gifts Director, Zoological Society of San Diego, P.O. Box 551, San Diego, CA 92112, or by telephone at (619)685-3215.

CRES REPORT
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SAN DIEGO ZOO
SAN DIEGO WILD ANIMAL PARK

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